Title: BELT/POCKET POLDER FOR PORTABLE APPARATUS

Abstract: The invention concerns a belt/pocket clip designed for use with small devices, e.g. mobile telephones. The clip consists of a part (2) to be attached to the device (1) itself and a belt clip (3), which are connected to each other by two or more strip-like springs (4 and 5) disposed on at least two levels so that, as seen from the side, the springs form one pair of oblique parallel sides of a rhomboid while the portions of said parts (2 and 3) between the ends of the springs form the other pair. The springs are fastened to said parts (2 and 3) so that all sides of the rhomboid tend to extend in the same direction, causing the belt clip to settle against the surface of the device (1). When the belt clip (3) is being pulled off the device (1), its angular position is hardly changed at all. As the thin belt clip is difficult to release from the surface of the device, it is additionally provided with a release lever (6), which, when turned, prizes the belt clip part (3) clear of the surface of the device (1) by applying its lobes (11) against the upper spring strip (4). The belt clip of the invention can be manufactured from a single flexible plate-like part in which the upper spring (4) is formed in the middle of the upper part between two elongated apertures. The lower springs (5) are formed in the middle part between elongated apertures and the edges. To prevent the belt clip part (3) from being bent, it is provided with a die-cut stiffening. The release lever (6) is pivoted on the clip part by lugs fitted under U-shaped nits provided in the belt clip. The back surface of the clip part can be coated e.g. with vinyl to increase friction. The belt clip described only adds about 1 mm to the thickness of the device.
BELT/POCKET HOLDER FOR PORTABLE APPARATUS

Object of the invention

The present invention relates to a belt/pocket clip for portable devices as defined in the preamble of claim 1.

Background of the invention

E.g. mobile telephone manufacturers produce finely shaped mobile telephones that take up very little space. However, they are generally not provided with any sort of holder that would allow it to be suspended on a belt or on the edge of a pocket. Users buy a clumsy case L (Fig. 1) as an accessory which covers the entire mobile telephone 1, or they fix an attaching part K (Fig. 2) to the telephone using double-sided tape or screws to provide a connection to a part O carried on a belt. Certain types are provided with a sort of clip N (Fig. 3), but it is too weak to be relied on.

A feature common to them all is that they increase the thickness of the device by as much as 10 mm and more, thus making them more difficult to use.

Brief description of the invention

The object of the present invention is to eliminate the problems associated with prior-art solutions and to achieve a belt/pocket clip for a small portable device, such as a mobile telephone, minidisc player or MP3 player, which in an idle state increases the thickness of the device but very little, even as little as about 1 - 1.5 mm, and which can still be easily and reliably fastened even to a thick belt. It takes up no space inside the device, so it can be easily used with finished constructions as well. It can also be attached e.g. to the back cover or the battery of a mobile telephone, so it can be taken into use even with products already sold.

In the belt/pocket clip of the invention, which comprises a part to be attached to the device and a belt clip part connected to each other via two or more strips, the strips are disposed in at least two groups so that they, as seen from the side, form one pair of oblique parallel sides of a rhomboid while the portions between the ends of the strips form the other pair of parallel sides.
The details of the features characteristic of the belt/pocket clip of the invention are given in the preambles of the claims presented below.

The belt/pocket clip of the invention provides several advantages. It takes up very little space. It is easy to fasten and release using a release lever. It works in all situations. When used with shorts, no belt is needed. When its wearer is running, it does not swing loosely. It provides a secure grip and is not released by accident as it has a spring whose 'rest position' is the closed position. It does not hamper the use of the device and it works well with vibratile ringing as it keeps the device close to the wearer's body. In addition, it is based on a simple principle and durable. It can be easily delivered together with a replacement battery or back cover even for devices already sold. Moreover, it is easy to manufacture and mount in place and its price is low. It remains firmly in position especially if its back surface has been treated with a rough or rubber-like coating to provide slip resistance.

Brief description of illustrations

In the following, the invention will be described in detail by the aid of a few examples with reference to the attached drawings, wherein

Fig. 1 shows a mobile telephone placed in a case provided with a belt clip,

Fig. 2 shows a device with a knob fixed to it to connect it to a belt clip,

Fig. 3 shows a mobile telephone with a clip fixedly attached to it,

Fig. 4a and 4b present a structure according to the invention, attached to a mobile telephone and separately in an open position,

Fig. 5 presents the structure in Fig. 4a and 4b in a closed position,

Fig. 6a presents a solution according to the invention in which the belt clip is made from a single part, and Fig. 6b shows a release lever needed in addition.

Fig. 7a and 7b illustrate the operation of the release lever,
Fig. 8 shows how the belt clip is shaped in the portion not allowed to bend,

Fig. 9a and 9b show what the belt clip of the invention could look like when attached to a mobile telephone, in closed and open positions,

Fig. 10 presents a clip according to the invention in which the inner surface of the clip part has been coated to increase friction,

Fig. 11 illustrates the insertion of a plate-like part into slots provided in the device,

Fig. 12 shows how the clip part is embedded in the back cover,

Fig. 13a - 13c illustrate the attachment of the clip to a device having a small protrusion on its back cover,

Fig. 14 illustrates the attachment of the clip to the back cover or battery of a device in accordance with Fig. 13a - 13c, and

Fig. 15a and 15b show how the clip is fastened to notches provided in the sides of the device, in rear view and in side view.

Description of some embodiments of the invention

Referring to Fig. 4a, the belt/pocket clip of the invention comprises a plate-like part 2 for attachment to the device 1 itself and a belt clip part 3, these two parts being connected to each other by two or more strip-like springs 4 and 5 disposed in at least two groups so that the springs or spring groups as seen from the side form one pair of parallel sides of a rhomboid while the portions of parts 2 and 3 between the spring ends form the other pair of parallel sides. The springs 4 and 5 are fastened to parts 2 and 3 parallely to these so that, in an idle position, all four sides of the rhomboid tend to extend in the same direction, causing the belt clip 3 to settle against the device 1 (Fig. 6). When the belt clip 3 is being pulled off the device 1, its angular position is hardly changed at all.

One of the spring strips 4 or 5 may be replaced with a rigid lever pivoted by its ends on parts 2 and 3 (Fig. 4b).
As the belt clip 3 in its idle position is in immediate contact with the surface of the device 1, it is difficult to release. Therefore, the invention comprises a release lever 6, which, when turned in the direction indicated by the arrow, prizes the belt clip 3 by the upper strip 4 to the open position (Fig. 4a).

Fig. 6a presents a version of the invention in which the parts 2, 3, 4 and 5 are made from a single spring-like plate, e.g. a steel plate. The part to be attached to the frame of the device consists of the upper part and its sides, which are provided with pre-drilled mounting holes 7. An upper spring 4 is formed in the middle of the upper part between two elongated apertures. The lower springs 5 are formed at the sides of the middle portion between elongated apertures and the outer edges. The belt clip part 3 consists of the lower part of the plate. As it is not allowed to bend, it is provided with a die-cut stiffening 12 as illustrated in Fig. 8.

Designed for use in the same belt clip made from a single spring-like plate is also a release lever 6 as illustrated in Fig. 6b, which is pivoted on the belt clip by inserting the lugs 9 in its lower part under nibs 8 provided in the belt clip, which have been bent to a curved shape (Fig. 6a and 7b). (In Fig. 7a, the upper part of the lower spring 5 has been left out). From Fig. 7a it can be seen that, when the release lever 6 is turned to the 'open' position, the nib 8 is bent starting from its point of attachment 7. Therefore, it tends to keep the release lever 6 continuously in its normal position parallel to the back surface of the device. The release lever 6 releases the belt clip by raising it by the upper strip 4 (Fig. 6a) by applying the upper edge of the lobes 11 against it. A gap is provided between the lobes 11 to allow the release lever to be inserted into position around the upper strip 4.

To improve the friction, the back part of the belt clip 3 can be coated e.g. with vinyl or a rubber-like film 13 or it can roughened mechanically or using a coating (Fig. 10). The surface may be made very rough as the clip is easy to open when it is to be released.

Fig. 9a and 9b further show what the belt clip of the invention could look like when attached to a mobile telephone 1, in the closed position and in the open position. Fig. 11 shows how the upper and lower edges 14, 15 of the plate-like part 2, which have been bent into a clasp-like form, are fitted into vertical slots 17, 18 made in the back 16 of the device 1 in conjunction with injection molding,
so that it can also be easily detached. Fig. 12 shows how the belt clip part 3 is embedded in a cut-out 19 made in the back cover.

Fig. 13a - 13c illustrate the way in which the clip is fastened to a device with slots 17, 18 for the plate-like part 2 in its back cover as illustrated in Fig. 11 and with a small protrusion 21 at their upper end to keep the clip in place. It can be detached from the device 1 by bending the edge over the protrusion 21, using e.g. the point of a knife. Fig. 14 illustrates the attachment of the clip to the back cover or to the battery of the device 1 in accordance with Fig. 13a - 13c.

Fig. 15a and 15b show how the clip is fastened to the device by fitting the edges 23 of the plate-like part 2, which are bent to the sides of the device, into notches 22 provided in the sides of the device 1.
CLAIMS

1. Belt/pocket clip designed for use with portable devices, e.g. mobile telephones, comprising a part (2) to be attached to the device (1) and a belt clip part (3), these two parts being connected to each other by two or more strips (4 and 5), characterized in that the strips (4 and 5) are disposed in at least two groups so that they, as seen from the side, form one pair of oblique parallel sides of a rhomboid while the portions of said parts (2 and 3) between the ends of the strips form the other pair of parallel sides, and that the strips (4 and 5) are fastened to said parts (2 and 3) parallelly to these so that, in an idle position, all sides of the rhomboid tend to extend in the same direction, causing the belt clip (3) to settle against the device (1).

2. Belt/pocket clip as defined in claim 1, characterized in that the strips are flexible.

3. Belt/pocket clip as defined in claim 1, characterized in that the strips are pivoted by their ends on said parts (2 and 3) and that they are rigid.

4. Belt/pocket clip as defined in claim 1, characterized in that it comprises a release lever (6) which, when being turned, prizes the entire belt clip part (3) by the upper strip (4) to some distance from the surface of the device (1) to release the clip.

5. Belt/pocket clip as defined in claim 1, characterized in that the part (2) to be attached to the device, the belt clip part (3) and the spring strips (4 and 5) are made from a single flexible plate-like part.

6. Belt/pocket clip as defined in claim 1, characterized in that the back part of the clip part (3) is provided with a friction coating (13) or roughened to improve friction.

7. Belt/pocket clip as defined in claim 1 for use with a device (1) having a back part (16), such as a back cover or a battery, characterized in that part (2) has been bent into a clasp-like form at both edges (14, 15) of the upper part so as to allow it to be fastened to slots (17, 18) provided in the back part (16) of the device (1).
8. Belt/pocket clip as defined in claim 1 for use with a device (1) having a back cover (16) or a battery, characterized in that the clip part (3) can be embedded in a cut-out (19) provided in it.

9. Belt/pocket clip as defined in claim 1 for use with a device (1) having a back cover (16) or a battery, characterized in that the clip can be fastened to the device by fitting the edges (23) of the plate-like part (2) into notches (22) provided in the sides of the device (1).

10. Belt/pocket clip as defined in claim 1 for use with a device (1) having a back part (16), such as a back cover or a battery, characterized in that the back part of the device comprises slots (17, 18) open at their upper ends to receive the plate-like part (2) and above them a small protrusion (21) to keep the clip in place.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A45F 5/02 // H04B 1/38, H04M 1/06
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A45F, H04B, H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>US 5664292 A (T. CHEN), 9 Sept 1997 (09.09.97)</td>
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<td>A</td>
<td>FR 29616016 U1 (LAUGESEN, L-L.), 2 January 1997 (02.01.97)</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

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